

TWO NEW GENERA OF TESSARATOMIDAE (HEMIPTERA: HETEROPTERA: PENTATOMOIDEA)

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Two new genera of the shield bug family Tessaratomidae are described and illustrated. *Tibiospina* gen. nov., with the type species *T. darlingtoni* sp. nov., is from several higher altitude rainforest localities in the Wet Tropics region of north Queensland. *Pseudosepina* gen. nov., with the type species *T. longula* sp. nov., is based on a single female specimen from central Madagascar. □ *Heteroptera, Tessaratomidae, new genera, Tibiospina, Pseudosepina, Queensland, Madagascar.*

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The shieldbug family Tessaratomidae occurs mainly in tropical and subtropical regions of the Old World at altitudes up to 3,500m. It includes many large, spectacular and colourful shield bugs with body lengths ranging from 8-44mm. The family includes three subfamilies, viz. Tessaratominae, Oncomerinae and Natalicolinae (Kumar, 1969a,b; Kumar & Ghauri, 1970). A recent world checklist includes 49 genera and 'about 235 species' (Rolston et al, 1993).

While undertaking a cladistic, generic revision of the Tessaratomidae (Sinclair, 1989) specimens of two new genera were discovered, one from tropical north Queensland, belonging to the subfamily Oncomerinae, and the other from Madagascar, belonging to the Tessaratominae. These are described here.

MATERIALS AND METHODS

Description of Genitalia. Descriptions of the male aedeagal conjunctival processes were made with the aedeagus viewed in profile while lying on its side in the natural position. The terms 'distal' and 'proximal' conjunctival processes are applied in a relative sense following Kumar & Ghauri (1970). The description of the female spermatheca commences from the bulb-end of the duct.

Preparation of Genitalia. Genital segments were cleared by immersion in boiling 10-15% KOH for 5-30 minutes. After several washes in tap water the segments were dissected using fine jewellers forceps and micropins mounted on the apex of matchsticks. The aedeagus was teased into its fully everted state by using fine jewellers forceps to grasp the basal plates of the aedeagal

phallosoma, and another pair to grasp the base of the vesica inside the phallosoma. After examination in tap water or 70% alcohol the genitalia were stored in glycerine-filled microvials beneath the specimen.

Line Drawings. Line drawings were made using a camera lucida attached to a Wild binocular microscope. Each scale bar applies to the line drawing closest to it.

Abbreviations. Female genitalia: igx1, incised posterior margin of gonocoxa 1. Male genitalia: pygophore: bp, base of paramere; dr, dorsal rim; drg, dorsal ridge; eo, external opening; p, paramere; lp, prominent ledge of pygophore; ps, pygophoral spine; svr, sharp medially directed ridge of ventral rim; sw, subvertical wall; tp, tongue-like process; vr, ventral rim; aedeagus: conjunctival processes: dld, dorsolateral distal; ld, laterodistal; vld, ventrolateral distal; vlp, ventrolateral proximal; v, vesica. Legs: ts, hind-leg tibial spine. Institutions: AMNH, American Museum of Natural History, New York; QM, Queensland Museum, Brisbane; SAM, South Australian Museum, Adelaide; ZIL, Zoological Institute, Leningrad.

Subfamily ONCOMERINAE Stål

Tibiospina gen. nov.

TYPE SPECIES. *Tibiospina darlingtoni* sp. nov.

ETYMOLOGY. Referring to the distinctive tibial spine of the male.

DIAGNOSIS. Head with lateral margins of jugae deeply incised medial to preocular tubercle (Fig. 2B). Male: abdominal tergum 7 with posterior

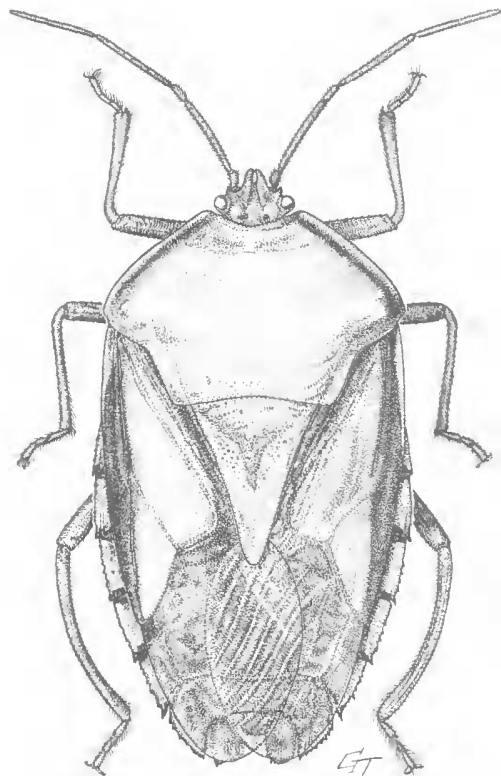


FIG. 1. *Tibiospina darlingtoni* gen. et sp. nov., ♀, dorsal view.

margin deeply incised to receive greatly enlarged pygophore (apex of incision reaching slightly posterior of an imaginary line drawn between the posterior angles of abdominal laterotergites 5) (Fig. 2C); abdominal sternum 7 medially longer than combined length of abdominal sterna 3-6 (Fig. 2D); posterior angles of abdominal segment 7 produced posteriorly, weakly dorsally and medially over lateral margins of pygophore (Fig. 2C); hind tibiae distinctly bowed, bearing a prominent preapical, anteromedially directed spine (Fig. 2A); pygophore with a distinctive pair of heavily sclerotised spines arising from the lateral margins of the exterior opening, spines curved posterodorsally then laterally and ventrally (Figs 2C, 3A, B). Female: hind tibiae bowed (Figs 1, 2F), lacking a medial, preapical spine.

DESCRIPTION. *Head* (Fig. 2B). Wider than long; antennae five-segmented, apex extending to scutellar apex, jugae narrowly separated to contiguous anterior to tylus; rostral segment 1

surpassing bucculae posteriorly; rostral apex reaching to mesosternum.

Thorax. Posterior pronotal margin produced over scutellar base (Figs 1, 2A); scutellum longer than wide, apex reaching abdominal tergum 6 (Fig. 2C); hamus of hind wing absent; prosternum medially subplanate, lacking a distinct posteriorly convergent carinate collar; mesosternum lacking anterior medial carina or tubercle, xyphus tumid; metasternum convex, posterior margin not produced over abdominal sternum 2.

Legs. fore femora unarmed on subapical, anterior margin of inferior surface; male with hind femora slender compared to fore and mid femora; sub-basal inferior surface unarmed; subapical, inferior surface unarmed.

Abdomen. Abdominal sternum 2 medially simple; abdominal sternum 3 medially produced as a spine to mesosternal xyphus (Fig. 2D), ventrum of spine flat, dorsum of spine adpressed to, or narrowly separated from, metasternum (when adpressed, contacting transverse ridge of metasternum); intersegmental suture of abdominal sternum 2-3 terminating dorsoanteriorly on lateral margin of abdomen.

Male Genitalia. Pygophore with external opening posterior; aedeagal conjunctiva with a pair of sclerotised dorsolateral distal processes (latter fused medially at base), a pair of small membranous laterodistal processes, a pair of sclerotised ventrolateral proximal processes, each bearing 3-4 minute spines on ventral, proximal surface, and one sclerotised ventrolateral distal process with apex medially cleft and serrate (Fig. 3C-E); vesica sclerotised, tubular, joined dorsally to ventrolateral distal process (Fig. 3D,E).

Female Genitalia. Sclerotised first and second rami absent; spermathecal bulb spherical in profile; spermathecal duct between bulb and distal flange tubular, with two flanges, slender, with lateral duct leading to sac-like expansion (Fig. 2E).

REMARKS. *Tibiospina* may be confused with the rare oncomerine genus *Garceus*, with which it is sympatric in north Queensland. However *Garceus* lacks both the pronotal extension over the base of the scutellum and the highly modified male abdomen and legs. *Tibiospina* is included in a key to world oncomerine genera (Sinclair, 2000).

***Tibiospina darlingtoni* sp. nov.**
(Figs 1, 2A-G, 3A-E)

ETYMOLOGY. In honour of the late P.J. Darlington Jnr, Harvard entomologist and biogeographer, who collected a specimen during his field work in Australia in 1957-58.

MATERIAL. Holotype, ♂, in QM (QMT62937). Label 1: NQ 10°31'S X 145°16'E, Mt. Lewis Rd, 29km from highway, 1100m, 23.xi.1998, C.R. Burwell; Label 2: Swept from roadside vegetation; genitalia undissected; Label 3: red holotype label with name handwritten by author. Paratype, ♂, in QM: Label 1: 145°30'E X 17°27'S, roadside adjacent to Mt. Hypipamee National Park, Atherton Tablelands, N. Qld, 10/12/1998, A. Rozeffelds; Label 2: attracted to light from complex notophyll rainforest; Label 3: blue paratype label with name handwritten by author. Right fore leg from femur missing; left hind wing glued on card beneath specimen; genitalia dissected; pinned with fore and hind wings at right angles to body; colour of specimen very faded (pale brown yellow) when compared to holotype. ♀ in QM: NE Qld, 3.5km W of Cape Tribulation (Site 7), 20-23 iv 1983, 680m. GB. Monteith, D.K. Yeates; left antennal segments 4, 5 missing; right antennal segments 1-5 carded beneath specimen; genitalia undissected. ♀ in AMNH. Label 1: Australia, Darlington; Label 2: Mt. Bellenden Ker, E. side, Q., 3-4500', xii 57, P.J. Darlington. Missing parts: left fore leg tarsal segments 2,3; right mid leg tarsal segments 2,3; left hind leg from femur onwards; left fore leg carded; genitalia dissected. ♀ in SAM. Label 1: Kuranda [145°35'E, 16°48'S] Queensland, F.P. Dodd; Label 2: *Garceus fidelis* Dist. (Musgrave's hand), Det. By A. Musgrave. Missing parts: left antennal segments 2 (from basal 1/3)-5; right antennal segments 4,5; left fore leg from femur onwards; left mid leg tarsal segments 2,3; right mid leg from trochanter onwards; right hind leg tarsal segments 2,3; mesosternum distorted by pin; genitalia dissected.

DESCRIPTION. MALE. Body length 17.0 (holotype)-17.5mm (paratype); dorsal view as in Fig. 2A.

Head (Fig. 2B). Moderately declivous (circa 45° to horizontal), smooth; antennae: segments 2-5 weakly depressed; segment 3 very short compared to segments 2, 4, and 5 (Fig. 2A); ratio of maximum antennal length to maximum body length 12:17 (holotype)-12:17.5 (paratype); bucculae subtriangular in profile; rostral apex terminating at, or slightly anterior to, mesosternal xyphus.

Thorax. Dorsum of pronotum, scutellum, propleuron and dorsal-most areas of meso- and metapleura irregularly punctate, latter concolourous with ground colour; hemelytra densely punctate, latter concolourous with hemelytra; remaining thoracic areas (and abdomen) smooth; pronotum: moderately declivous, anterolateral margins not produced, acute in cross section, weakly reflexed, entire; posterolateral angles produced slightly over hemelytral claval suture (Fig. 2A); scutellar disc weakly tumose basally, latter extending as obsolescent longitudinal carina to scutellar subapex (Fig. 2C).

Legs. Dorsal surfaces of tibiae weakly sulcate; tarsal segment 1 in dorsal view as wide as segment 3.

Abdomen. Margins of lateroterga 3-7 serrate; dorsal-most surface of abdominal sternum 3 spine apically free of thoracic mesosternum; trichobothrial pairs orientated parallel to inter-segmental sutures, positioned dorsal to a line drawn through abdominal spiracles 3-7, commencing from abdominal sternum 3 the pairs becoming progressively closer to the abdominal spiracles (Fig. 2D); abdominal segment 8: concealed beneath abdominal sternum 7, tergite shorter medially than sternite, spiracle present.

Pygophore. Longer than high, internal opening anterior, profile in dorsal view as in Fig. 3A, in posterior view as in Fig. 3B; dorsal rim forming a pronounced, weakly arrow-shaped ridge medially, area anterior of the ridge weakly depressed; dorsal ridge extending postero-laterally to sub-apical area of pygophore, medially with a transverse area marking the dorsal-most part of a sub-vertical wall which extends ventrally and laterally to ventral rim; ventral rim immediately ventral and posterior to external opening of pygophore forming large dorsally and weakly posteriorly directed tongue-like process (apex of process medially incised), lateral basal margins of tongue enclosing base of parameres, ventral rim forming sharp, medially-directed ridge on dorsal-most half; prominent ledge present on pygophore wall lateral to base of paramere and slightly dorsal to ventral rim. **Proctiger.** Sclerotised, covering aedeagus dorsally, with pale, medial desclerotised line. **Genitalia.** Paramere (Fig. 2G) elongate, slightly recurved, with ventral, preapical angulate sclerotised lobe, a postero-laterally directed tooth at apical 2/3 of length joined by heavily sclerotised strip on lateral face to heavily sclerotised, sharp, produced apex; ventral and medial surfaces asetose; dorso-lateral face sparsely setose above heavily sclerotised strip; *in situ* parameres curved postero-laterally and dorsally from external opening of pygophore (Fig. 3B).

Colour (living specimens). Dorsum with brown-yellow, venter yellow-brown; ocelli red; apical quarter of antennal segment 5 yellow brown; antennae (excluding apical quarter of segment 5), vittae on pronotal dorsal submargin and hemelytra (areas submarginally over two triangular sclerites at base, medial of claval suture and slightly medial thence lateral of medial fracture to lateral margins and posteriorly to coriomembranal suture), tarsal segments 2,3

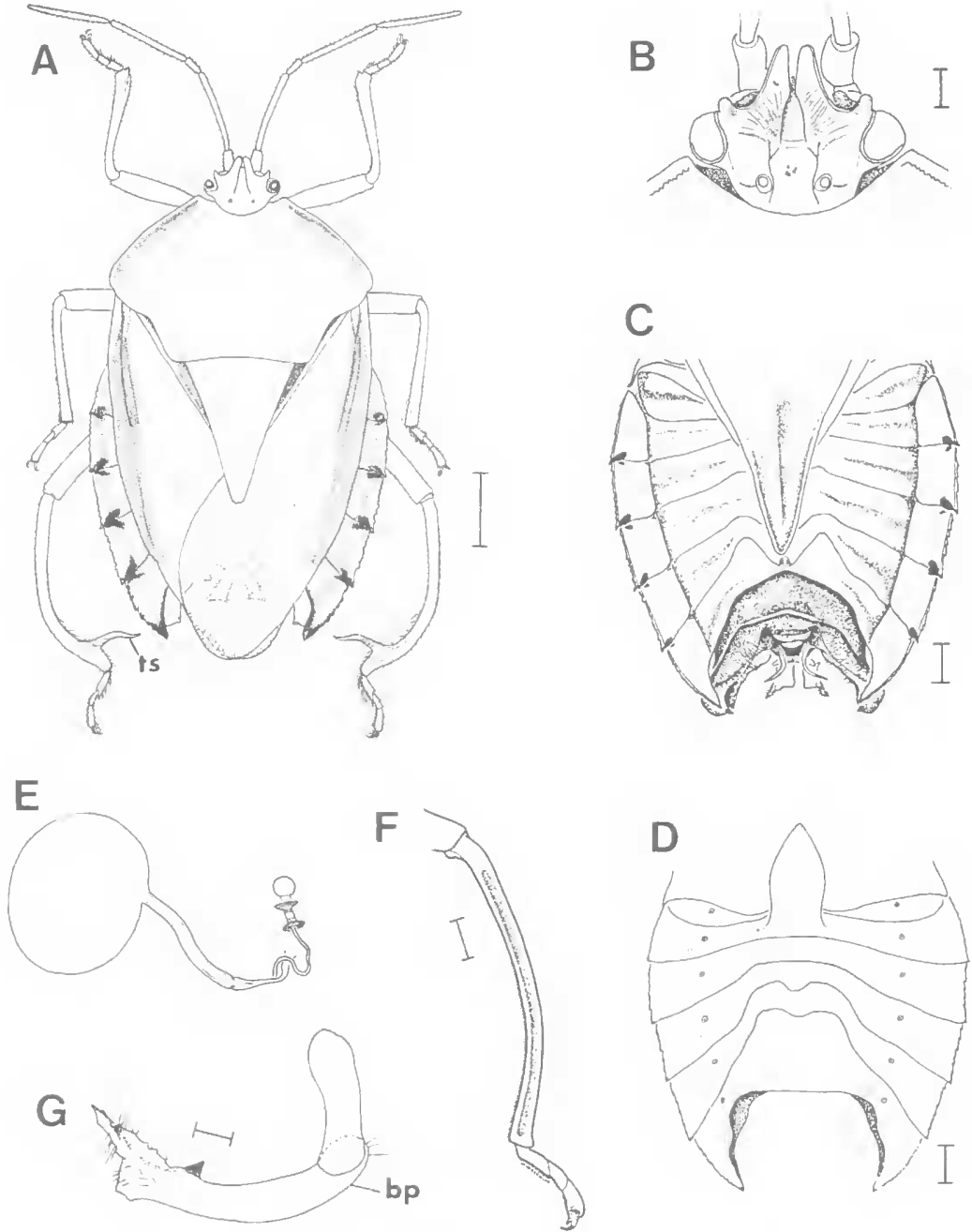


FIG. 2. *Tibiospina durlingtoni* sp. nov.: A, ♂, dorsal view; B, ♂, head, dorsal view; C, ♂, scutellum, abdomen, pygophore, dorsal view (wings removed); D, ♂, abdomen, ventral view (pygophore removed); E, spermatheca; F, ♀, hind tibia; G, left paramere, medial face. Scale bars: A = 2.48mm; B = 0.25mm; C = 0.61 mm; D = 0.74mm; E = 0.99mm; F = 0.91mm; G = 0.25mm.

(excluding apical ½ of claws), dark brown with reddish tinge; exposed abdominal laterotergites 3-7 and legs (femur apically, tibia, tarsal segment 1), red-brown. Forewing membrane reflective. Apical ½ of claws, posterior angles of abdominal lateroterga 3-7, subquadrate transverse areas medial to and adjoining posterior angles of abdominal lateroterga 3-6, and small, narrow, subtriangular transverse areas on anterior sub-lateral angles of abdominal lateroterga 4-7, black (Fig. 2C).

FEMALE (Fig. 1). As in male, except: body length 19-22mm; head: ratio of maximum antennal length to maximum body length not recorded; legs: apex of fore tibiae on medial side produced into tubercle (positioned dorsal to comb of antennal cleaning organ), tibial dorsal surfaces lightly sulcate; abdomen: margins of paraterga 8, 9 serrate; female genitalia: medial submargins of paraterga 9 and gonocoxae 1 depressed, gonocoxae 2 visible in ventral view ring sclerites well developed; colour: apex of fore and mid leg tibiae, apical half of hind leg tibiae, red-brown; paraterga 8, 9 black.

Subfamily TESSARATOMINAE Stål

Pseudosepina gen. nov.

TYPE SPECIES. *Pseudosepina longula* sp. nov.

ETYMOLOGY. Referring to its similarity to *Sepina*.

DIAGNOSIS. Body elongate, slender (Fig. 3F); first gonocoxae of female genitalia with distinctly incised posterior margin (Fig. 31).

DESCRIPTION. *Head* (Fig. 3G). Wider than long; antennae at least three-segmented (segments missing apically); jugae medially separated anterior to tylus; rostral segment 1 extending posteriorly beyond bucculae; rostral apex terminating at mesosternum.

Thorax. Membrane of forewing opaque; hind wing with A1 (= Pcu) stridulitrum; scutellum longer than wide, apex extending to abdominal tergum 4; prosternum medially weakly depressed basally, lacking a distinct posteriorly convergent carinate collar; mesosternum lacking a anterior medial tubercle or carina, xyphus raised as acute longitudinal carina; metasternum forming weakly elevated, convex carina, posterior margin not produced over abdominal sternum 2.

Abdomen. Medial area of abdominal sternum 2, 3 flat.

Female Genitalia. Paratergite 8 not expanded laterally compared to paratergite 9; medial margins of paratergite 9 contiguous, fused as one piece; sclerotised rami absent; spermathecal bulb non-spherical in profile, spermathecal duct between bulb and distal flange tubular, dilated along the majority of its length part below the proximal flange (Fig. 3H).

Male. Unknown.

REMARKS. This genus may be confused with the tessaratomine genus *Sepina*. However, *Sepina* has a shorter, broader body when viewed dorsally.

Pseudosepina longula sp. nov.

(Fig. 3F-I)

ETYMOLOGY. Specific name refers to the elongate nature of the body.

MATERIAL. Holotype ♀, in ZIL. Label 1: Madagascar, Tananarive (hand written in black ink). Label 2: Clermont, Vend. (hand-written in black ink). Missing parts: right and left antennal segments 4, 5; left mid leg tarsus; right hind leg tarsal segments 2, 3. Right hind wing slide mounted in Euparal. Detached rostrum and left antennal segments 2, 3 carded. Genitalia dissected.

DESCRIPTION. *Female.* Maximum body length 13.5mm; appearance in dorsal view as in Fig. 3F.

Head (Fig. 3G). Weakly declivous (approx. 20° to the horizontal) in profile; dorsum with punctate, wineglass shaped coloured area (punctures aconcolourous with wineglass shaped area); bucculae triangular in profile.

Thorax. Pronotum weakly declivous in profile; pronotum (except lateral margins, medial vitta), scutellum (except lateral margins, medial vitta), hemelytra (except lateral margins), punctate, punctures aconcolourous with body ground colour; thoracic propleuron, more dorsal areas of meso- and metapleura, irregularly punctate; pronotum: antero-lateral margins not produced, acute in cross section, reflexed, roughened by minute spine-bearing tubercles.

Legs. Fore coxae separated by a wide gap from mid and hind coxae; tibial dorsal surfaces planate, apical ventral surfaces armed with minute spines; tarsal segment 1 in dorsal view as wide as segment 3.

Abdomen. Tergum and ventral sternum areas above vittae irregularly punctate; lateral margins roughened by minute tubercles; female genitalia with long setae on medial submargins of paraterga 9.

Colour. Yellow with slight tinge of brown ground colour; punctures of head, pronotum, scutellum,

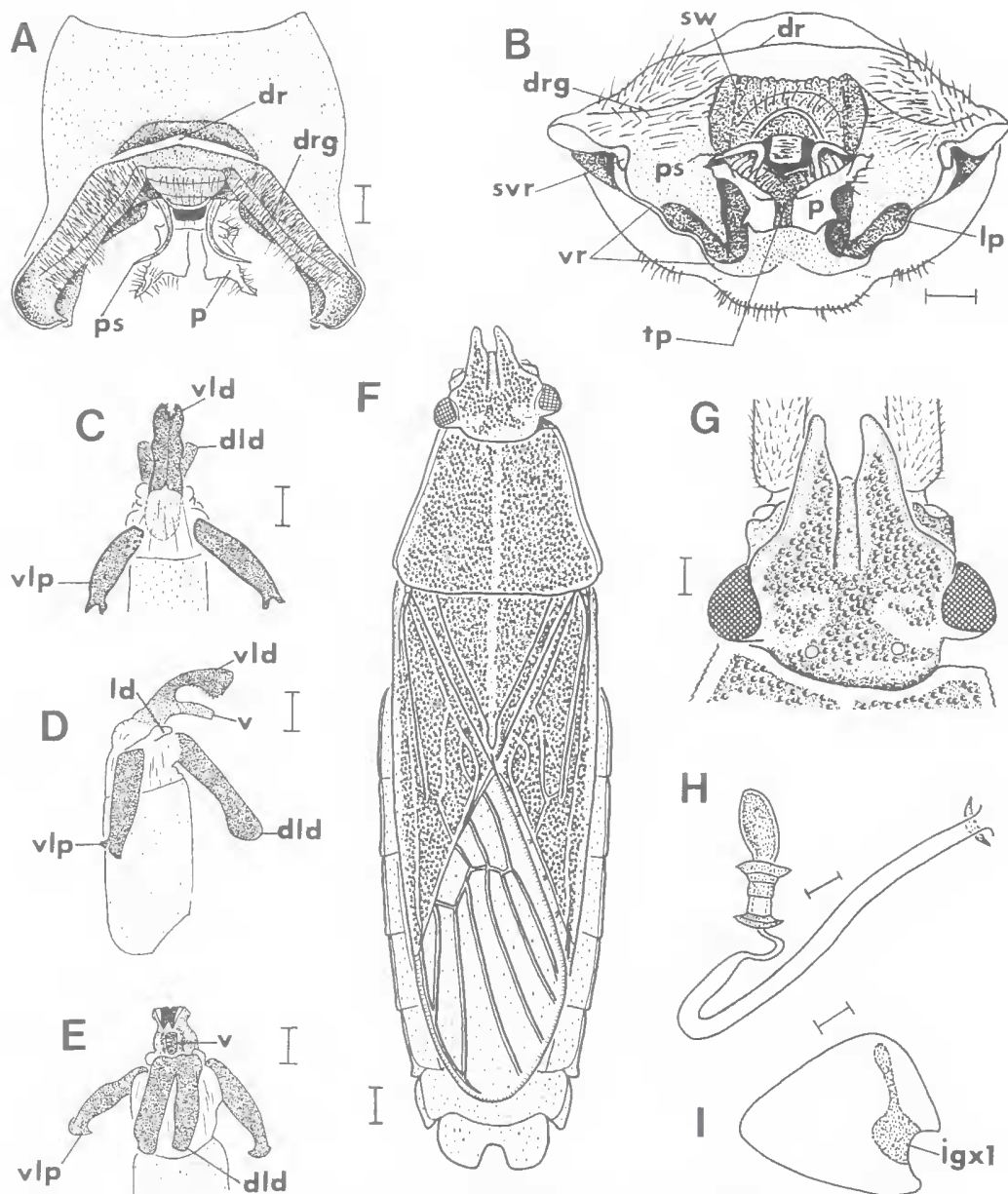


FIG. 3. A-E, *Tibiospina darlingtoni* sp. nov., ♂; A, pygophore, dorsal view; B, pygophore, posterior view; C, aedeagus (everted), ventral view; D, aedeagus (everted), lateral view; E, aedeagus (everted), dorsal view. F-I, *Pseudosepina longula* sp. nov., ♀; F, dorsal view; G, head, dorsal view; H, spermatheca; I, first gonocoxa. Scale bars: A = 0.37mm; B = 0.53mm; C,D,E = 0.25mm; F = 0.57mm; G = 0.28mm; H,I = 0.22mm.

hemelytra, and apical ¼ of pretarsal claws, dark brown-black; ventrum of body length with pair of dark brown-black, wide vittae, each vitta positioned on laterodorsal head area (on

antennophore and immediately across and posterior to compound eye), laterodorsal thoracic pleural area (dorsal to ostiole of metathoracic scent gland), abdomen (ventral to imaginary line

drawn through spiracles), narrowing across more dorsal area of gonocoxae 1, and terminating on ventral margins and submargins as semicircular area; apex of rostral segment 4 with dark brown spot; minute tibial spines black.

Male. Unknown.

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